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ABSTRACT

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Aspect Licensing and Verb Movement in Mandarin Chinese

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[Abstract] An inquiry into the internal structure of Infl has led to the view in the generative grammar that universally the head of the I(nfl)P(hrase) is decompositional in that a series of functional categories can be located there, e.g. T(ense)P(hrase), Agr(eement)P(hrase), Neg(ation)P(hrase), Asp(ect)P(hrase), etc.; each of these categories projects its own Spec and head (Pollock 1989, among many others) and the order of these phrasal categories is parametrically determined (Ouhalla 1990). A natural question arises as to how this view is reflected in the Chinese Infl. In this paper we focus our attention on the aspect makers, i.e. the verbal particles *-zhe*, *- le*, and *-guo* in Mandarin Chinese and discuss the properties of the Chinese Infl with respect to aspect licensing. Our investigation indicates that neither verb raising to Infl (Asp°) nor Infl (Asp°) lowering to V takes place in the overt syntax. The analysis that we propose is that aspect markers in Chinese are base-generated as verbal suffixes; they are licensed at the level of L(ogical)F(orm) via movement of the verbal complex [V+Asp] to the functional head Asp°.

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1. Introduction

Recently, it has been assumed in the GB (Government and Binding) literature that the I(nfl)P(hrase) can be further decomposed into a series of functional projections (Pollock 1989; Laka 1990; Ouhalla 1990, and Chomsky 1991, among others)[1], for instance, T(ense)P, Agr(eement)P, Mod(al)P, Neg(ation)P, Asp(ect)P, etc., and each of these categories projects its own Spec and head. The universal ordering of these functional projections has been proposed on parametric basis, for example, the Neg Parameter postulated in Ouhalla (1990) states that Neg can select VP or Neg can select TP. In comparison with languages possessing rich inflectional morphological systems, Chinese is a language which has a meager Infl. The internal structure of Infl in Chinese is relatively simple. It is generally agreed that there are no overt agreement and tense morphologies in Chinese.[2] Even modals are taken to be non-Infl constituents (Lin & Tang 1991).[3] The only categories available are Aspect, and Negation.[4] In this paper, we discuss how the features in the AspP

[1] The works of Pollock and Chomsky are widely circulated in manuscript forms prior to publication.

[2] It remains to be determined whether Chinese allows a morphologically empty TP. In other words, TP, as a functional category, may still project in the Chinese syntax despite its morphological status. We leave this issue open here.

[3] Lin and Tang argue that modals in Chinese are verb/adjective-like and therefore have independent main predicate status; they take CP complements so that they project their own argument structures of a sentence.

[4] For instance, as argued in Gu (1992a) and Ernst (1992).

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are licensed in Chinese. The issues are centered on whether overt verb movement to Asp° or Asp° lowering to the verb followed by successive verb raising to Asp° at L(ogical)F(orm) takes place in the syntax, if aspect markers in Chinese are taken be Infl elements. The result of our discussion shows that neither possibility exists in Chinese. The plausible solution is that aspect markers, not being Infl elements, are verbal suffixes in the base; aspect licensing is implemented via head movement of the verb to Asp° at LF in the manner of feature checking. Our analysis is supported by independent evidence derived from Gu (1992b) and is also confirmed by the proposal that the Chinese Infl is morphologically vacant (Huang 1991; 1992) so that verbs in general do not move overtly to adjoin to Infl.

The paper is organized as follows. In section 2, the basic structure of the Chinese AspP is outlined. In section 3, the problems derived from both verb raising and Infl lowering are discussed, and the proposed analysis is sketched out. The plausibility of the morphologically empty Infl of Chinese is laid out in section 4, accompanied by a discussion of how it is related to the proposed analysis. A conclusion is drawn in section 5.

2. The AspP

In Chinese, aspectual marking of finite verbs are instantiated by three particles in the forms of V+*le* (了) (perfective), V+*zhe* (着) (durative), and V+*guo* (過) (perfective/experiential). Relevant examples are given in (1) - (3), respectively.

(1) ta kan-le yi-ben shu.
he look-Asp one-CL book
他看了一本書。
'He has read a book.'

(2) ta zheng kan-zhe yi-ben shu.
he just look-Asp one-CL book
他正看着一本書。
'He is reading a book.'/'He is looking at a book.'

(3) ta kan-guo yi-ben shu.
he look-Asp one-CL book
他看過一本書。
'He has read a book.'

Traditionally, these three particles are treated uniformly as functional words, and they are referred to in the literature of Chinese linguistics as aspect markers (Li & Thompson 1981; Smith 1991, among others). But the two perfective

markers, *le* and *guo* are syntactically different in that *guo* can only attach to a verb stem, whereas *le* can attach either to a verb stem or to a complex, i.e. [V+*guo*]:

(4) ta yijing kan-guo-le nei-ben shu le.
he already read-Asp-Asp that-CL book Asp
他已經看過了那本書了。
'He has already read that book.'

A distinction between *le* and *guo* is made by Zhou (1990). The proposal is that *guo* may be construed as a derivational morpheme because of its lexical productivity in forming compounds like *chuanguo* (穿過) 'pass through', *jingguo* (經過) 'pass by', etc., while *le* and *zhe* be treated as inflectional morphemes. Under Zhou's assumptions, *le* in (1) and *zhe* in (2) are construed as elements dominated by the AspP; *guo*, being a lexical morpheme, is not an Asp° element, but part of a lexical item whose derivation is confined only to the lexicon.

This assumption does not seem to be plausible, however. As we will show later in the discussion, *le* and *zhe* are not inflectional morphemes. Furthermore, the aspectual property of *guo* is obvious in (3) and (4). Intuitively, the string of *kanguo* (看過) is not a compound, but only a verb plus an aspect marker. The correct assumption is that there are two instances of *guo* in Chinese. One is a verb, meaning 'spend' (sometime), as in *ta guo-le yi-ge yukuaide shengri* (他過了一個愉快的生日。) 'He's had/spent a happy birthday.' The other is a perfective/experiential aspect marker. With respect to the ordering fact observed in (4), one plausible solution seems to be that the two aspect markers, *le* and *guo*, may be licensed under different heads. Based on the Mirror Principle (in the spirit of Baker 1985)[5] in functional projection and morphological realization (Speas 1991), it can be postulated that *le* is licensed under the head of AspP which embeds another AspP under whose head *guo* is licensed. As an approximation, we propose the following representation for the projection of the double AspP.[6] Since *zhe* does not co-occur with other aspect markers, by assumption, it is projected under a single AspP.

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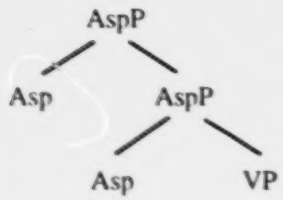
5 The Mirror Principle introduced in Baker (1985) captures the isomorphic process of syntactic derivations and morphological derivations. As informally stated in Baker (p.375 (4)), the principle requires that morphological derivations must directly reflect syntactic derivations (and vice versa). For further developments of the Mirror Principle, interested readers are referred to Grimshaw (1986), and Speas (1991).

6 As we will propose later, in Chinese the AspP does not project its head and Spec morphologically. But either there are features in Asp° which need to be licensed or Asp° is a

(5)



The concept of licensing will become clearer as our discussion proceeds. Among the three aspect markers, we will focus our attention on the perfective marker *le*.

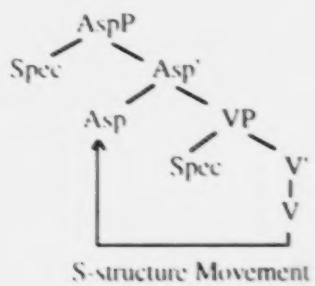
3. Aspect Licensing

Following Pollock (1989) and Chomsky (1991), based on the work of Emonds (1978), there are two possible derivations for the aspect marker *le* in the sentence in (6): i) the verb moves up to Asp via head movement and adjoin to *le* at S-structure; ii) *le* lowers to the verb at S-structure and then the verb complex, i.e. [V+Asp] moves up to the head of AspP at LF (Logical Form) in order to form a proper chain (Chomsky 1991).

(6) Zhangsan xie-le yi-feng xin.
Zhangsan write-Asp one-CL letter
張三寫了一封信。
'Zhangsan wrote a letter.'

(7) illustrates these two derivations.

(7) a.



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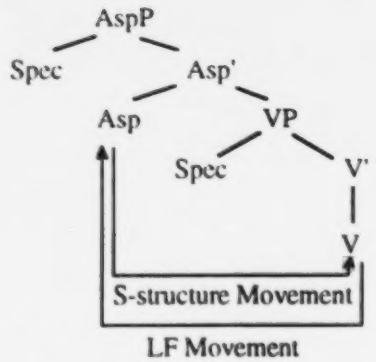
feature checking domain for aspectual suffixes. In neither case, however, is the Spec position relevant.

b.



In (7b), without the second step of movement, the chain resulting from the first step of movement will contain (*t* , ..., Asp), and when Asp is adjoined to V at S-structure to form a verb complex [V+Asp], the trace of Asp c-commands the verb complex, constituting an illegitimate chain. To create a proper chain, Chomsky argues that at LF, the verb complex must subsequently raise to the position of *t*, thereby eliminating the initial trace and the improper chain.[7]

The first possibility is not available in Chinese as contrasted by the word order facts in (8a) and (8b); verb raising to Infl (Asp°) has crossed the VP licensed manner adverb (see for example, Sportiche 1988; Pollock 1989, and see Bowers 1988, 1991 for an alternative analysis), giving rise to the ill-formed (8b). This provides evidence that no overt verb raising to Asp° is allowed in Chinese.

(8) a. Zhangsan hen kuaide xie-le yi-feng xin.
Zhangsan very quickly write-Asp one-CL letter
張三很快地寫了一封信。
'Zhangsan quickly wrote a letter.'

b. * Zhangsan xie-le hen kuaide yi-feng xin.
Zhangsan write-Asp very quickly one-CL letter
* 張三寫了很快地一封信。
* 'Zhangsan wrote quickly a letter.'

Given (8), it may seem possible that Chinese has movement of aspect to verb instead of verb raising to aspect. This possibility has been assumed by a number of linguists (for instance, Cheng 1989; Zhou 1990; Tang 1990b, and Cheng & Li 1991), that is, in Chinese, aspect licensing is implemented via Asp

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[7] It is pointed out in Chomsky (1991) that the lowering process is normally not permitted if a raising option is also available. The spirit of such a constraint is to minimize the cost of derivation, i.e. shorter derivations are always chosen over longer ones.

lowering to the verb at S-Structure, and then the complex [V+Asp] raises back to Asp° at LF to satisfy the proper chain condition.

In our investigation (Gu 1992b) into the verb internal measure phrases in Chinese, we find evidence which shows that the second possibility does not exist in Chinese either. To illustrate our findings, let us digress on the analysis a little bit.

In Chinese, there exists a type of verbal measure phrases, traditionally referred to as *dong liang ci* (動量詞), 'measure phrases of verbs'. These measure phrases occur as the internal indirect objects of verbs, for instance, *yi yan* (一眼) 'one glance' in *kan yi yan* (看一眼) 'take a glance', and *yi jiao* (一腳) 'one kick' in *ti yi jiao* (踢一腳) 'kick a kick. Under our analysis, these measur phrases are cognate object of the verb (in the spirit of Larson 1988b) and they are projected in the syntax by the semantic specification of event quantification. Being an internal indirect object, the measure phrase is located in the complement position of a verb. Some examples are given in (9).

(9) a. Zhangsan ti-le nei-ge ren yi jiao.
Zhangsan kick-Asp that-CL person one foot
張三踢了那個人一腳。
'Zhangsan gave that man a kick.'

b. Lisi kan-le nei-ge ren yi yan.
Lisi look-Asp that-CL person one glance
李四看了那個人一眼。
'Lisi took a glance at that man.'

There are cases where the measure phrases can alternate with the direct object, as exemplified in (10).

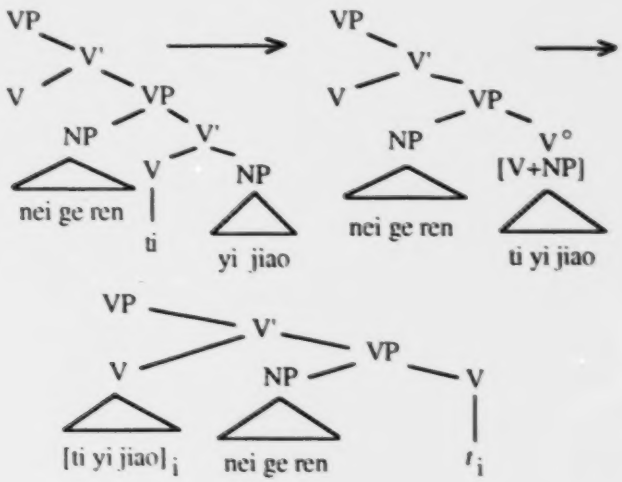
(10) a. Zhangsan ti-le yi jiao nei-ge ren.
Zhangsan kick-Asp one foot that-CL person
張三踢了一腳那個人。
'Zhangsan gave that man a kick.'

b. Lisi kan-le yi yan nei-ge ren.
Lisi look-Asp one glance that-CL person
李四看了一眼那個人。
'Lisi took a glance at that man.'

To account for this alternating pattern, we have proposed, following Larson (1988a & b), that the verb and its cognate object be optionally reanalyzed into a V°. The sentences in (10) indicate that reanalysis has applied whereas in (9) it does not apply. The structural representations (11) and (12) below show in

partial the two derivations subsumed under verb movement, respectively.[8] In (11), based on (10a), after the application of reanalysis, the newly formed V°, i.e. [V+NP], moves up to the head position of the higher VP to theta-and Case-mark the direct object *nei ge ren* (那個人) 'that man', giving rise to the surface form *ti yi jiao nei ge ren* (踢一腳那個人) 'kick one kick that man' in (10a).

(11)



If reanalysis does not apply, the verb moves alone to the higher V° position to theta- and Case-mark the object NP *nei ge ren* (那個人) 'that man', yielding the

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[8] According to Larson (1988a), structural Cases, i.e. the canonical Subjective Case and Objective Case, or Nominative Case and Accusative Case, respectively, are contained in Infl and the Objective Case is transmitted to the verb from Infl. The subject NP is base-generated in the Spec of a higher VP where it receives a theta-role (in the spirit of the VP-internal Subject Hypothesis (Koopman and Sportiche 1987; Kuroda 1988; Kitagawa 1986, among others)) and then moves to the Spec of Infl to receive Nominative Case. The direct object in a complex predication structure is base-generated in the Spec of the lower VP where it is construed as subject of a "small clause" (Cf. Chomsky 1986a). When a transitive verb assigns two Objective Cases, one is structural and the other is inherent. The former is contained in Infl and is transmitted to the verb that it governs. The latter is a purely lexical property of the verb. In both cases, Case assignment is implemented by the requirement that V govern and be adjacent to the Case recipient.

Adopting these ideas to our discussion, we may hypothesize that the direct object receives a structural Case that is transmitted from Infl to a VP headed by a governing verb. Hence, in the first two configurations of (11), the verb does not govern the direct object. To achieve Case-assignment requirement, the verb has to move upward until it reaches a governing position, i.e. the head of the higher VP, as illustrated in the third structural representation of (11) and the one of (12). This accounts for the motivation of verb movement as discussed in Larson.

As for the verb internal measure phrase, it receives an inherent Objective Case either directly from the verb if it is reanalyzed with the verb into a new V°, as is the case in (11), or from the trace left by the verb if the verb moves upward alone, as reflected in (12). It is pointed out in Larson that the trace left by the moved verb inherits the Case-assigning properties from the verb.

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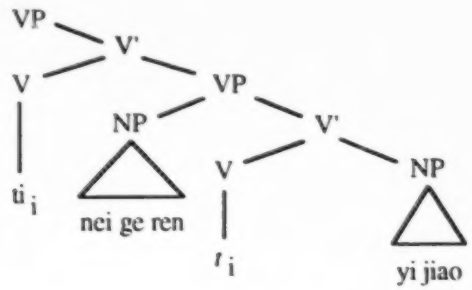
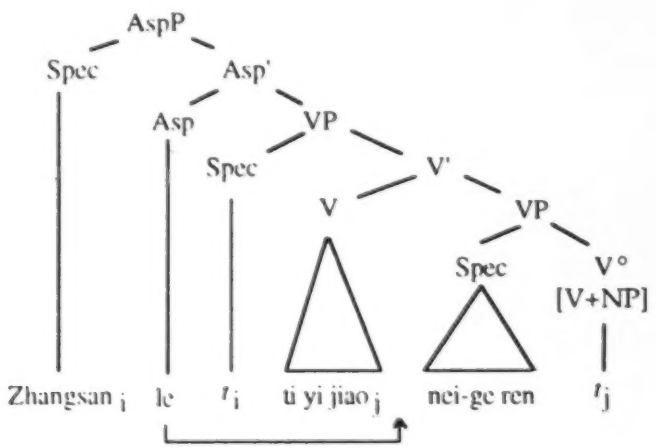
surface string *ti nei ge ren yi jiao* (踢那個人一腳) 'kick that man one kick', which corresponds to (9a).

(12)



Now let us consider the case of aspect markers in these sentences. If the perfective aspect marker *le* is a base-generated Asp° morpheme, and it is lowered to the verb at S-structure, we would expect it to be attached to the verb, namely, it has to be attached to the single verb or the reanalyzed V°. In the latter case, the resultant word order based on the example of (10a) as well as (11) would be *ti yi jiao le* (踢一腳了) 'kick one kick Asp' instead of *ti-le yi jiao* (踢了一腳) 'kick Asp one kick'. (13) illustrates the point.

(13)



(13) would yield an ill-formed sentence such as (14). The ungrammaticality of (14) thus eliminates the possibility that aspect lowering takes place in the Chinese syntax.

(14) * Zhangsan ti yi jiao le nei-ge ren.
Zhangsan kick one foot Asp that-CL person
* 张三踢一脚了那个人。

The only plausible analysis for the aspect markers in question is, then, that they are base-generated with the verb as verbal suffixes. An immediate question arises as to how to correlate the base-generated aspect markers and the functional head Asp° in AspP. In other words, how are the aspectual features in Asp° licensed if AspP is a functional category the head of which contains features?

In Chomsky (1991), it has been emphasized that all features in the syntactic derivation must be licensed as required by the principle of Full Interpretation (FI) (Chomsky 1986a) at LF. The intuitive content of the notion of FI is that an element can appear in a presentation only if it is properly "licensed". Hence, any unlicensed feature will result in an "illegitimate" object and the structure involved will not be fully interpreted.

Suppose that AspP in Chinese does not project its head and Spec morphologically,[9] but the Asp° node contains aspectual features such as [+perfective], [+durative], etc. which must be licensed at LF as required by the principle of FI. Further, assume that the licensing is implemented via verb plus its relevant aspect marker(s) adjoining to the feature containing head, Asp°. Based on the recent proposals by Kitagawa (1986), Speas (1991), and Chomsky (1991), we may interpret the feature checking process as involving the following procedures (see also Gu 1992c). When generated from the base, the Chinese aspect suffixes are each inherently marked with relevant features such as [+perfective], [+durative], etc. These features must be checked off for the LF interpretation. The empty Asp° in Infl serves as the checking domain of these features. The semantic content of aspect in Asp° requires that in the feature checking process the verbal suffix move along with its host verb to the feature checking domain because the latter is the main predicate of an action or an event to which the aspectuality is relevant.

Now consider the relevant level at which the feature checking process takes place. Recent proposal of Chomsky and Lasnik (1991), formulated in the spirit of economy of derivation (Chomsky 1991), states that if operations need not be

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9 By assuming this, we are obliged to say that in Chinese AspP is dominated by TP which overtly projects its Spec and head. This possibility allows the VP-internal subject (see section 4) to raise to the Spec of TP for Nominative Case assignment. The head of TP contains [± finite] features, presumably.

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overt to satisfy certain conditions, they are assigned to the LF component, applying as "late" as possible in the derivation. In light of this proposal, we postulate that in the present case the movement of the verb plus its aspect suffix to Asp° must be an LF operation, assuming that only morphological conditions need to be satisfied overtly and that the aspect licensing process in Chinese is not morphologically based. Since the Chinese aspect markers are not Infl morphemes, operations pertaining to their feature licensing can be postponed until the derivation reaches the level of LF.

Support for this view is already present in our earlier observation in (8b) that overt verb movement to Asp° results in ungrammaticality. In section 4, we discuss a further piece of evidence that the Chinese Infl does not motivate overt verb movement.

4. The Empty Infl in Chinese

Under the various versions of internal subject hypothesis (ISH) (Koopman and Sportiche 1985; Kuroda 1985; Kitagawa 1986, among others), subject in languages like English is base-generated in the Spec of VP where it receives a theta-role under the maximal projection of VP. Then it is moved to the Spec of IP at S-structure to receive Nominative Case from Infl. In the framework of Chomsky (1986b), the movement of subject to the Spec of Infl is made possible by a process of V-raising to Infl, thereby making Infl into a lexical item and debarrierizing VP for subject raising. V-raising to Infl, as pointed out by Chomsky, is required by morphological properties. For instance, tense and aspect morphemes in Infl must be picked up by the verb.

Aoun and Li (1989) argue that while V-raising to Infl and subject raising from the Spec of VP to the Spec of IP exist in English, they are not available in Chinese due to the degenerate nature of the Chinese Infl. According to A&L, subject in Chinese always stays in the Spec of VP, because either VP in Chinese counts as a barrier, or alternatively, a trace must be properly bound as well as be lexically governed. Not being a lexical item, Infl cannot lexically govern the trace of the raised subject. A&L further contend that subject raising to the Spec of IP does not apply in Chinese because the language admits *double subject structures*. Their arguments are derived from the following examples (A&L's (26)):

(15) a. Zhangsan, erzi kaoshang daxue le.
Zhangsan son passed college Asp
張三，兒子考上大學了。
'Zhangsan's son passed the entrance exam for a college.'

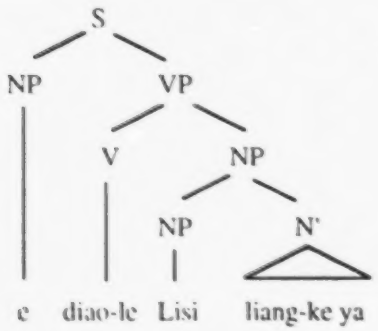
b. Zhangsan, tou hen teng.
Zhangsan head very ache
張三，頭很疼。
'Zhangsan's head aches.'

Based on A&L, an NP moving from the Spec of VP to the Spec of IP in Chinese would violate the Projection Principle and the Theta Criterion because in Chinese both Spec positions are Case and theta positions.

An argument based on examples of this type seems to be too sketchy, however. Notice that of the two preverbal NPs in (15), the first one is semantically a Possessor of the second one. Recent work done by Xu (1991) suggests that in Chinese a Possessor and a Possessee can be projected under the same NP node. Under Xu's analysis, in a sentence like (16), the surface subject *Lisi* is base-generated in the Spec of the object NP.

(16) a. Lisi diao-le liang-ke ya.
Lisi fall-Asp two-CL teeth
李四掉了兩顆牙。
'Two of Lisi's teeth fell out.'

b.



Since *diao* 'fall' is an unaccusative verb, it lacks a semantic subject. The derivation of the surface subject from the object NP position is either required by the Extended Projection Principle (Chomsky 1982) which states that a sentence must have a subject, or motivated by the Unaccusative Hypothesis (Perlmutter 1979; Burzio 1986) that the object cannot receive Case from an unaccusative verb and it must move to the subject position in order to be Case-marked. Hence *Lisi* undergoes the process of Possessor Raising to get to the

subject position.[10] Alternatively, *Lisi* and *liang-ke ya* 'two teeth' can move as one constituent to the subject position, yielding (17a). After that, *de* is inserted to derive (17b).

(17) a. Lisi liang-ke ya diao le
Lisi two-CL teeth fall Asp
李四兩顆牙掉了

b. Lisi-de liang-ke ya diao le.
Lisi's two-CL teeth fall Asp
李四的兩顆牙掉了。
'Lisi's two teeth fell out.'

This analysis provides the option that a Possessor NP can be base-generated within an NP.[11] There is no need, therefore, to assume two separate subject positions for the Possessor and the Possessee NPs in (15). A&L's preliminary assumption that Chinese structurally excludes subject raising to the Spec of IP is thus invalidated.

A&L's view is also challenged by Huang (1990). In his analysis of VP-fronting and reconstruction, Huang is able to show that in contrast to object-fronting, when a VP is fronted in English as well as in Chinese, a trace of the subject must also be fronted with it, suggesting that the subject in both languages has raised from the Spec of VP to the Spec of IP.

Now that subject raises from the Spec of VP to the Spec of IP in Chinese just as it does in English, presumably raising is forced by the requirement of nominative Case assignment in both languages, do both languages require V-movement to Infl, as noted earlier, to allow for such a raising? For English, empirical evidence has been shown by various authors that V-raising to Infl is motivated by fulfilling morphological requirements (in particular, Chomsky 1991; Pollock 1989). For Chinese, we have argued that V-raising to Infl (Asp°) is not overt.

In Huang (1982), it is postulated that Infl in Chinese is lexical, so it lexically governs VP and presumably its Specifier. Abstracting away from the issue concerning the licensing of aspectual morphemes in Chinese, the consequence of Huang's assumption is that verbs in Chinese do not have to raise to Infl at S-

[10] In Xu, it is assumed that the genitive marker *de* results from a PF insertion so that no problem of stranding *de* will arise in the case of a Possessor Raising structure.

[11] This possibility has been discussed in Tang (1990a). Tang argues that in a Chinese nominal expression, *Zhangsan-de nei san-ben shu* (張三的那三本書) 'those three books of Zhangsan', *Zhangsan* is base-generated in Spec of NP and later raised to Spec of DP. In this respect, we consider it legitimate to say that in Chinese there exists the possibility of Possessor Raising at the phrase level as well as at the sentence level.

structure in order to legitimatize the movement of the VP internal subject to the Spec of Infl, since VP is not a barrier for such a movement.

With respect to verb raising, Huang's assumption about the Chinese Infl can be entertained in two important ways. On the one hand, it offers the possibility of verb raising through Infl without giving rise to violation to the chain well-formedness condition formulated in Li (1990). On the other hand, it eliminates the possibility that verb raising to Infl takes place at S-structure in Chinese. We briefly discuss these two respects below.

In Chinese, NPs, VPs, and APs can take corresponding measure expressions, which are traditionally referred to as *mingliangci* (名量詞) 'measure phrases of nouns', *dongliangci* (動量詞) 'measure phrases of verbs', and *xingliangci* (形量詞) 'measure phrases of adjectives', respectively. Huang (1991) discussed a type of *dongliangci*, i.e. verbal measure phrases which semantically quantify over events/actions, but syntactically behave like *mingliangci*, i.e. measure phrases of nouns. For instance, the prenominal duration and frequency phrases in sentences like (18) and (19) appear preceding nouns rather than verbs:

(18) a. ta xue-le san nian yingwen.
he learn-Asp three year English
他學了三年英文。
'He learned English for three years.'

b. * ta san nian xue-le yingwen.
he three year learn-Asp English
* 他三年學了英文。

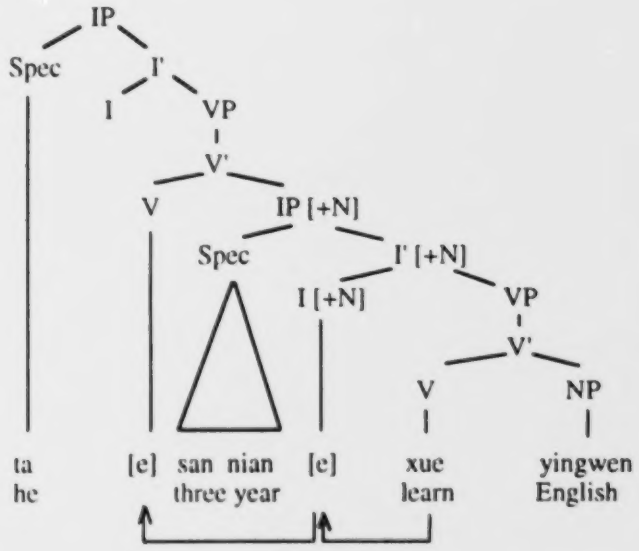
(19) a. ta qu-le yi ci Beijing.
he go-Asp one time Beijing
'He went to Beijing once.'
他去了一次北京。

b. * ta yi ci qu-le Beijing.
he one time go-Asp Beijing
* 他一次去了北京。

According to Huang, this syntax-semantics mismatch can be resolved if these sentences are viewed as involving i) a structure of gerundive nominalization, which the measure phrases are modifying, and ii) a process of verb-raising from the embedded nominal phrase to the matrix clause, because the latter has a lexically empty verb which must be morphologically supported.

Under Huang's system, a sentence like (18a) has an abbreviated underlying structure in (20):[12]

(20)



Based on the fact that in Chinese, virtually all action verbs can occur in this structure, Huang (1992) makes a further claim that the empty verb in the matrix sentence is a DO type of action verb which subcategorizes for an event argument identified in the structure of (20) by the gerundive nominal. The external argument of DO is an Agent. This claim generalizes the verb movement behavior in Chinese, that is, all action verbs may move out of the event structure represented by the nominal IP into the matrix DO verb.

The relevance of Huang's analysis to our discussion is that an embedded action verb is now able to move head-to-head out of a nominal IP into the matrix V position. There are two conceivable consequences of such an analysis. The first consequence is that on the surface value such a movement may violate the chain well-formedness constraint formulated by Li (1990).

Li makes the observation that in general the complement of a causative verb does not contain Infl or clausal elements, as reflected in (21). Li attributes this

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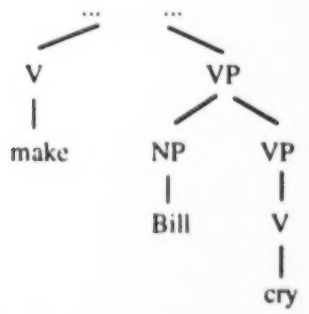
12 Huang (1992) does not provide detailed information as to whether the matrix subject is base-generated in Spec of VP and raised to Spec of IP. According to Huang (1990), subject in Chinese follows from the Internal Subject Hypothesis (ISH) in the sense of Kuroda (1988) and Kitagawa (1986). To be consistent, we would assume that the subject in (20) is raised from the Spec of VP.

fact to the structural consideration that the complement of a causative verb is a VP "small clause" (Cf. Chomsky 1986a), as shown in the structure of (22). Since no Infl is projected in the small clause, neither an infinitive nor a full clause is expected to occur in this complement structure.

(21) a. John made Bill cry.
b. * John made Bill to cry.
c. * John made (that) Bill cried.

(22)



The relevance for such a structural constraint on the complement, according to Li, is that causative predicates are most commonly Verb Incorporation triggering elements. In many languages, the verb in the complement phrase raises to adjoin to the causative verb via head movement, a process characterized by Baker (1988) as Verb Incorporation (VI). Li argues that a necessary condition on VI is that the matrix verb must be subcategorized for a VP complement instead of a clausal complement. This condition, as postulated in Li, is imposed by the general principle of chain well-formedness for head movement. Under this principle, a movement chain must contain elements of the same kind. For instance, a lexical chain contains only lexical heads such as V, whereas a functional chain has only functional heads in it, i.e. C, I, etc. (22) provides the right configuration for head movement in languages exhibiting VI. If VI applies, the lower verb moves into the head of the higher verb, forming a chain which contains two Vs; hence, it is a well-formed chain. On the contrary, if the complement of the matrix verb is a clausal element such as a CP, the embedded verb would move first to I, and then to C, and finally adjoin to the matrix verb. Such a movement would constitute a chain containing inconsistent elements, i.e. V, C, I, V. The two lexical Vs would have two intervening

functional elements between them, i.e. C, and I, thereby producing an ill-formed chain.[13]

Come back to the structure in (20) proposed by Huang (1991; 1992). Notice that the movement of the embedded verb in (20) involves two steps. First, the verb moves into the Infl of its own clause, and then it moves into the matrix V° position. The chain resulting from such a movement contains inconsistent elements [V, I, V]. To maintain the chain well-formedness condition, whereas to allow in a structure like (20) the verb to move through the embedded Infl and further into the matrix V, Huang (1992) postulates that the Chinese Infl is morphologically empty; verb raising through Infl does not change the value of the verb and a chain resulting from such a movement is consistently formed by Vs. Hence, Li's chain well-formedness condition is respected.

A further consequence of assuming Huang's interpretation of Chinese Infl is that overt verb movement through the nominative Infl, a step necessary in the derivation of (20), does not change the category of V, which is a [+V, -N] element, into a [+N, -V] element. Since Infl is morphologically empty, no categorial conflict arises concerning the moved verb. Note that the same effect does not obtain in English, because an English nominal Infl inevitably contains an *-ing* affix which is to be attached to a verb that moves into Infl. Further movement of the nominalized verb into a higher verb is thus prohibited in that language.

The morphologically empty Infl indicates that elements which are normally considered to be Infl elements in other languages, such as the tense, agreement

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[13] Li attributes this chain well-formedness condition to the Condition C of the binding theory, as given in Chomsky (1986b).

(i) An r-expression is A-free (in the domain of the head of its maximal chain).

With some modification of the definitions of the binding theory which depends on A- versus A-bar positions, Li proposes that the kind of X° elements, i.e. V°, I°, and C°, be interpreted in terms of T(heta-related)-positions and T-bar positions, in the sense that they are either directly or indirectly involved in theta-assignment and that these notions be applied to the definition of the binding conditions:

(ii) A. An anaphor is locally T-bound.
B. A pronoun is locally T-free.
C. A variable is T-free (in the domain of the head of its maximal chain).

A variable is in turn defined as the following:

(iii) An empty category is a variable iff it is in a T-position and is locally T-bar-bound.

With these definitions, Li is able to show that in an inconsistent X° chain, e.g. (V, I, V), the original trace of the V is T-bar-bound by I as well as T bound by V, resulting in an improper binding relation which holds between X° and XP, and Condition C as defined in (ii) above is violated.

and aspect morphemes, are not available in the Chinese Infl. Hence, no head movement, i.e. verb raising to Asp° or aspect lowering, is to be motivated at S-structure. This provides support for our analysis about the Chinese aspect markers as base-generated verbal suffixes.[14]

5. Conclusion

To conclude, aspect markers in Mandarin Chinese are not projected as morphemes in the functional category of Asp°; they are suffixed to the verb in the base. The overt head movement convention of the verb to Asp° or aspect lowering to the verb found in languages where aspect markers are morphemes in Infl is not relevant to the Chinese data. It is proposed that the head of AspP serves as the checking domain of aspect features which must be licensed onto corresponding verbs plus their suffixes. The licensing is not implemented via verb movement at S-structure, rather, it is done by [V+Asp] raising to Asp° at LF. Such an analysis is made possible by the assumption that Infl in Chinese is morphologically empty so that overt head movement triggered by the fulfillment of morphological requirement is unmotivated in the language.

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[14] Ernst (1992) makes a similar proposal under a different view.

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